

Part No. 301271-D Rev 00
December 2000

600 Technology Park Drive
Billerica, MA 01821-4130

56/64K DSU/CSU Adapter Module *Supplement*

NORTEL
NETWORKS™

Copyright © 2000 Nortel Networks

All rights reserved. December 2000.

The information in this document is subject to change without notice. The statements, configurations, technical data, and recommendations in this document are believed to be accurate and reliable, but are presented without express or implied warranty. Users must take full responsibility for their applications of any products specified in this document. The information in this document is proprietary to Nortel Networks NA Inc.

Trademarks

NORTEL NETWORKS is a trademark of Nortel Networks.

AN and Passport are registered trademarks and Advanced Remote Node, ANH, ARN, BayRS, and BCC are trademarks of Nortel Networks.

Microsoft, MS, MS-DOS, Windows, and Windows NT are registered trademarks of Microsoft Corporation.

All other trademarks and registered trademarks are the property of their respective owners.

Statement of Conditions

In the interest of improving internal design, operational function, and/or reliability, Nortel Networks NA Inc. reserves the right to make changes to the products described in this document without notice.

Nortel Networks NA Inc. does not assume any liability that may occur due to the use or application of the product(s) or circuit layout(s) described herein.

USA Requirements Only

Federal Communications Commission (FCC) Compliance Notice: Radio Frequency Notice

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy. If it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to take whatever measures may be necessary to correct the interference at their own expense.

European Requirements Only

EN 55 022 Statement

This is to certify that the Nortel Networks BN router is shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55 022 Class A (CISPR 22).

Warning: This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take appropriate measures.

Achtung: Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

Attention: Ceci est un produit de Classe A. Dans un environnement domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilisateur de prendre les mesures spécifiques appropriées.

EC Declaration of Conformity

This product conforms (or these products conform) to the provisions of Council Directive 89/336/EEC and 73/23/EEC.

Japan/Nippon Requirements Only

Voluntary Control Council for Interference (VCCI) Statement

この装置は、情報処理装置等電波障害自主規制協議会（V C C I）の基準に基づくクラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Taiwan Requirements

Bureau of Standards, Metrology and Inspection (BSMI) Statement

警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Canada Requirements Only

Canadian Department of Communications Radio Interference Regulations

This digital apparatus (BN router) does not exceed the Class A limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Règlement sur le brouillage radioélectrique du ministère des Communications

Cet appareil numérique (BN router) respecte les limites de bruits radioélectriques visant les appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada.

Canada CS-03 Rules and Regulations

Notice: The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent the degradation of service in some situations.

Canada Requirements Only *(continued)*

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Notice: For equipment using loopstart lines, please note that the Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5. The REN is located on the "FCC Rules Part 68" label located on the bracket of the module, or on the back of the unit.

Canada CS-03 -- Règles et règlements

AVIS: L'étiquette d'Industrie Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme aux normes de protection, d'exploitation et de sécurité des réseaux de télécommunications, comme le prescrivent les documents concernant les exigences techniques relatives au matériel terminal. Le Ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunication. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêche pas la dégradation du service dans certaines situations.

Les réparations de matériel homologué doivent être coordonnées par un représentant désigné par le fournisseur. L'entreprise de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause de mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

Avertissement: L'utilisateur ne doit pas tenter de faire ces raccordements lui-même; il doit avoir recours à un service d'inspection des installations électriques, ou à un électricien, selon le cas.

AVIS: Veuillez prendre note que pour tout appareillage supportant des lignes de type "loopstart," l'indice d'équivalence de la sonnerie (IES) assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent être raccordés à une interface. La terminaison d'une interface téléphonique peut consister en une combinaison de quelques dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 5. Le REN figure sur l'étiquette "FCC Rules Part 68" située sur le support du module ou à l'arrière de l'unité.

FCC Part 68 Compliance Statement

This equipment complies with Part 68 of FCC Rules. All direct connections to telephone network lines must be made using standard plugs and jacks compliant with FCC Part 68. Please note the following:

1. You are required to request service from the telephone company before you connect the unit to a network. When you request service, you must provide the telephone company with the following data:
 - When you request T1 Service, you must provide the telephone company with
 - The Facility Interface Code
 - Provide the telephone company with all the codes below:
 - 04DU9-BN (1.544 MB, D4 framing format)
 - 04DU9-DN (1.544 MB, D4 framing format with B8ZF coding)
 - 04DU9-1KN (1.544 MB, ESF framing format)
 - 04DU9-1SN (1.544 MB, ESF framing format with B8ZF coding)
 - 04DU9-1ZN (1.544 MB, ANSI ESF and ZBTISI without line power)
 - The telephone company will select the code it has available.
 - The Service Order Code(s) (SOC): 6.0F
 - The required Universal Service Order Code (USOC) jack: RJ48C
 - When you request Primary Rate ISDN Service, you must provide the telephone company with
 - The Facility Interface Code: 04DU9-1SN (1.544 MB, ESF framing format with B8ZF coding)
 - The Service Order Code(s) (SOC): 6.0F
 - The required Universal Service Order Code (USOC) jack: RJ48C
2. Your telephone company may make changes to its facilities, equipment, operations, or procedures that could affect the proper functioning of your equipment. The telephone company will notify you in advance of such changes to give you an opportunity to maintain uninterrupted telephone service.
3. If the unit causes harm to the telephone network, the telephone company may temporarily discontinue your service. If possible, they will notify you in advance, but if advance notice is not practical, you will be notified as soon as possible and will be informed of your right to file a complaint with the FCC.
4. If you experience trouble with the unit, please contact the Nortel Networks Technical Solutions Center in your area for service or repairs. Repairs should be performed only by service personnel authorized by Nortel Networks.

United States	1-800-2LANWAN
Valbonne, France	33-4-92-96-69-68
Sydney, Australia	61-2-9927-8800
Tokyo, Japan	81-3-5740-1700
5. You are required to notify the telephone company when you disconnect the unit from the network.

Nortel Networks NA Inc. Software License Agreement

NOTICE: Please carefully read this license agreement before copying or using the accompanying software or installing the hardware unit with pre-enabled software (each of which is referred to as “Software” in this Agreement). BY COPYING OR USING THE SOFTWARE, YOU ACCEPT ALL OF THE TERMS AND CONDITIONS OF THIS LICENSE AGREEMENT. THE TERMS EXPRESSED IN THIS AGREEMENT ARE THE ONLY TERMS UNDER WHICH NORTEL NETWORKS WILL PERMIT YOU TO USE THE SOFTWARE. If you do not accept these terms and conditions, return the product, unused and in the original shipping container, within 30 days of purchase to obtain a credit for the full purchase price.

1. License grant. Nortel Networks NA Inc. (“Nortel Networks”) grants the end user of the Software (“Licensee”) a personal, nonexclusive, nontransferable license: a) to use the Software either on a single computer or, if applicable, on a single authorized device identified by host ID, for which it was originally acquired; b) to copy the Software solely for backup purposes in support of authorized use of the Software; and c) to use and copy the associated user manual solely in support of authorized use of the Software by Licensee. This license applies to the Software only and does not extend to Nortel Networks Agent software or other Nortel Networks software products. Nortel Networks Agent software or other Nortel Networks software products are licensed for use under the terms of the applicable Nortel Networks NA Inc. Software License Agreement that accompanies such software and upon payment by the end user of the applicable license fees for such software.

2. Restrictions on use; reservation of rights. The Software and user manuals are protected under copyright laws. Nortel Networks and/or its licensors retain all title and ownership in both the Software and user manuals, including any revisions made by Nortel Networks or its licensors. The copyright notice must be reproduced and included with any copy of any portion of the Software or user manuals. Licensee may not modify, translate, decompile, disassemble, use for any competitive analysis, reverse engineer, distribute, or create derivative works from the Software or user manuals or any copy, in whole or in part. Except as expressly provided in this Agreement, Licensee may not copy or transfer the Software or user manuals, in whole or in part. The Software and user manuals embody Nortel Networks’ and its licensors’ confidential and proprietary intellectual property. Licensee shall not sublicense, assign, or otherwise disclose to any third party the Software, or any information about the operation, design, performance, or implementation of the Software and user manuals that is confidential to Nortel Networks and its licensors; however, Licensee may grant permission to its consultants, subcontractors, and agents to use the Software at Licensee’s facility, provided they have agreed to use the Software only in accordance with the terms of this license.

3. Limited warranty. Nortel Networks warrants each item of Software, as delivered by Nortel Networks and properly installed and operated on Nortel Networks hardware or other equipment it is originally licensed for, to function substantially as described in its accompanying user manual during its warranty period, which begins on the date Software is first shipped to Licensee. If any item of Software fails to so function during its warranty period, as the sole remedy Nortel Networks will at its discretion provide a suitable fix, patch, or workaround for the problem that may be included in a future Software release. Nortel Networks further warrants to Licensee that the media on which the Software is provided will be free from defects in materials and workmanship under normal use for a period of 90 days from the date Software is first shipped to Licensee. Nortel Networks will replace defective media at no charge if it is returned to Nortel Networks during the warranty period along with proof of the date of shipment. This warranty does not apply if the media has been damaged as a result of accident, misuse, or abuse. The Licensee assumes all responsibility for selection of the Software to achieve Licensee’s intended results and for the installation, use, and results obtained from the Software. Nortel Networks does not warrant a) that the functions contained in the software will meet the Licensee’s requirements, b) that the Software will operate in the hardware or software combinations that the Licensee may select, c) that the operation of the Software will be uninterrupted or error free, or d) that all defects in the operation of the Software will be corrected. Nortel Networks is not obligated to remedy any Software defect that cannot be reproduced with the latest Software release. These warranties do not apply to the Software if it has been (i) altered, except by Nortel Networks or in accordance with its instructions; (ii) used in conjunction with another vendor’s product, resulting in the defect; or (iii) damaged by improper environment, abuse, misuse, accident, or negligence. THE FOREGOING WARRANTIES AND LIMITATIONS ARE EXCLUSIVE REMEDIES AND ARE IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Licensee is responsible

for the security of its own data and information and for maintaining adequate procedures apart from the Software to reconstruct lost or altered files, data, or programs.

4. Limitation of liability. IN NO EVENT WILL NORTEL NETWORKS OR ITS LICENSORS BE LIABLE FOR ANY COST OF SUBSTITUTE PROCUREMENT; SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES; OR ANY DAMAGES RESULTING FROM INACCURATE OR LOST DATA OR LOSS OF USE OR PROFITS ARISING OUT OF OR IN CONNECTION WITH THE PERFORMANCE OF THE SOFTWARE, EVEN IF NORTEL NETWORKS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL THE LIABILITY OF NORTEL NETWORKS RELATING TO THE SOFTWARE OR THIS AGREEMENT EXCEED THE PRICE PAID TO NORTEL NETWORKS FOR THE SOFTWARE LICENSE.

5. Government licensees. This provision applies to all Software and documentation acquired directly or indirectly by or on behalf of the United States Government. The Software and documentation are commercial products, licensed on the open market at market prices, and were developed entirely at private expense and without the use of any U.S. Government funds. The license to the U.S. Government is granted only with restricted rights, and use, duplication, or disclosure by the U.S. Government is subject to the restrictions set forth in subparagraph (c)(1) of the Commercial Computer Software—Restricted Rights clause of FAR 52.227-19 and the limitations set out in this license for civilian agencies, and subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause of DFARS 252.227-7013, for agencies of the Department of Defense or their successors, whichever is applicable.

6. Use of software in the European Community. This provision applies to all Software acquired for use within the European Community. If Licensee uses the Software within a country in the European Community, the Software Directive enacted by the Council of European Communities Directive dated 14 May, 1991, will apply to the examination of the Software to facilitate interoperability. Licensee agrees to notify Nortel Networks of any such intended examination of the Software and may procure support and assistance from Nortel Networks.

7. Term and termination. This license is effective until terminated; however, all of the restrictions with respect to Nortel Networks' copyright in the Software and user manuals will cease being effective at the date of expiration of the Nortel Networks copyright; those restrictions relating to use and disclosure of Nortel Networks' confidential information shall continue in effect. Licensee may terminate this license at any time. The license will automatically terminate if Licensee fails to comply with any of the terms and conditions of the license. Upon termination for any reason, Licensee will immediately destroy or return to Nortel Networks the Software, user manuals, and all copies. Nortel Networks is not liable to Licensee for damages in any form solely by reason of the termination of this license.

8. Export and re-export. Licensee agrees not to export, directly or indirectly, the Software or related technical data or information without first obtaining any required export licenses or other governmental approvals. Without limiting the foregoing, Licensee, on behalf of itself and its subsidiaries and affiliates, agrees that it will not, without first obtaining all export licenses and approvals required by the U.S. Government: (i) export, re-export, transfer, or divert any such Software or technical data, or any direct product thereof, to any country to which such exports or re-exports are restricted or embargoed under United States export control laws and regulations, or to any national or resident of such restricted or embargoed countries; or (ii) provide the Software or related technical data or information to any military end user or for any military end use, including the design, development, or production of any chemical, nuclear, or biological weapons.

9. General. If any provision of this Agreement is held to be invalid or unenforceable by a court of competent jurisdiction, the remainder of the provisions of this Agreement shall remain in full force and effect. This Agreement will be governed by the laws of the state of California.

Should you have any questions concerning this Agreement, contact Nortel Networks, 4401 Great America Parkway, P.O. Box 58185, Santa Clara, California 95054-8185.

LICENSEE ACKNOWLEDGES THAT LICENSEE HAS READ THIS AGREEMENT, UNDERSTANDS IT, AND AGREES TO BE BOUND BY ITS TERMS AND CONDITIONS. LICENSEE FURTHER AGREES THAT THIS AGREEMENT IS THE ENTIRE AND EXCLUSIVE AGREEMENT BETWEEN NORTEL NETWORKS AND LICENSEE, WHICH SUPERSEDES ALL PRIOR ORAL AND WRITTEN AGREEMENTS AND COMMUNICATIONS BETWEEN THE PARTIES PERTAINING TO THE SUBJECT MATTER OF THIS AGREEMENT. NO DIFFERENT OR ADDITIONAL TERMS WILL BE ENFORCEABLE AGAINST NORTEL NETWORKS UNLESS NORTEL NETWORKS GIVES ITS EXPRESS WRITTEN CONSENT, INCLUDING AN EXPRESS WAIVER OF THE TERMS OF THIS AGREEMENT.

Contents

Preface

Before You Begin	xv
How to Use This Supplement	xv
Text Conventions	xvi
Acronyms	xvi
Hard-Copy Technical Manuals	xvii
How to Get Help	xvii

Chapter 1

Using the 56/64K DSU/CSU Adapter Module in an Access Node (AN) or Access Node Hub (ANH) Router

Verifying AN/ANH Router Requirements	1-1
Attaching Cables	1-1
Completing Software Configuration	1-3
Interpreting LEDs	1-4

Chapter 2

Using the 56/64K DSU/CSU Adapter Module in a Passport ARN Router

Verifying ARN Router Requirements	2-1
Attaching Cables	2-2
Completing Software Configuration	2-3
Interpreting LEDs	2-4

Chapter 3

Using the 56/64K DSU/CSU Adapter Module in a Passport 5430 Multiservice Access Switch

WAN Adapter Module Placement Considerations	3-1
Verifying Passport 5430 Requirements	3-2
Attaching Cables	3-3
Completing Software Configuration	3-4
Interpreting LEDs	3-5

Chapter 4

Using the 56/64K DSU/CSU Adapter Module in a Passport 2430 Multiservice Access Switch

Attaching Cables 4-1

Completing Software Configuration 4-2

Interpreting LEDs 4-3

Figures

Figure 1-1.	56/64K DSU/CSU Adapter Module Connector on an AN or 12-Port ANH	1-2
Figure 1-2.	56/64K DSU/CSU Adapter Module Connector on an 8-Port ANH	1-2
Figure 1-3.	56/64K DSU/CSU Adapter Module LEDs	1-4
Figure 2-1.	ARN 56/64K DSU/CSU Adapter Module (Slot 2)	2-2
Figure 2-2.	ARN 56/64K DSU/CSU Adapter Module LEDs	2-4
Figure 3-1.	56/64K DSU/CSU Adapter Module Connector on a Passport 5430	3-3
Figure 3-2.	56/64K DSU/CSU Adapter Module LEDs	3-5
Figure 4-1.	56/64K DSU/CSU Adapter Module Connector on a Passport 2430	4-2
Figure 4-2.	56/64K DSU/CSU Adapter Module LEDs	4-3

Tables

Table 1-1. PROM Diagnostic and Boot Code for AN/ANH Routers 1-1

Table 1-2. 56/64K DSU/CSU Adapter Module LEDs 1-4

Table 2-1. PROM Diagnostic and Boot Code for ARN Routers 2-1

Table 2-2. 56/64K DSU/CSU Adapter Module LEDs 2-4

Table 3-1. WAN Adapter Combinations 3-2

Table 3-2. PROM Diagnostic and Boot Code Requirements 3-2

Table 3-3. 56/64K DSU/CSU Adapter Module LEDs 3-5

Table 4-1. 56/64K DSU/CSU Adapter Module LEDs 4-3

Preface

The 56/64K DSU/CSU adapter module provides an interface for direct connection to Telco leased-line circuits. The 56/64K DSU/CSU adapter module provides an integrated DSU/CSU to directly connect to either 64 Kb/s Clear Channel or 56 Kb/s DDS services.

Before You Begin

This guide is intended for qualified service personnel who are installing the 56/64K DSU/CSU adapter module in an AN[®]/ANH[™], Passport[®] ARN[™], Passport 5430, or Passport 2430 for the first time or who need to install or replace any customer-replaceable unit (CRU). A qualified service person should have appropriate technical training and experience and be aware of the hazards involved in installing and replacing CRUs.

How to Use This Supplement

This WAN adapter module can be used with several different platforms. Refer to the table below to find the chapter that contains the information appropriate for the platform you are using.

Platform	Refer to
AN or ANH	Chapter 1
Passport ARN	Chapter 2
Passport 5430	Chapter 3
Passport 2430	Chapter 4

Text Conventions

This guide uses the following text conventions:

bold text

Indicates command names and options and text that you need to enter.

Example: Enter **show ip {alerts | routes}**.

Example: Use the **dinfo** command.

italic text

Indicates file and directory names, new terms, book titles, and variables in command syntax descriptions. Where a variable is two or more words, the words are connected by an underscore.

Example: If the command syntax is:

show at <valid_route>

valid_route is one variable and you substitute one value for it.

Acronyms

This guide uses the following acronyms:

BRI	basic rate interface
CRU	customer-replaceable unit
CSU	cable service unit
DSU	data service unit
IP	Internet Protocol
LED	light emitting diode
PROM	programmable read-only memory
WAN	wide area network

Hard-Copy Technical Manuals

You can print selected technical manuals and release notes free, directly from the Internet. Go to the support.baynetworks.com/library/tpubs/ URL. Find the product for which you need documentation. Then locate the specific category and model or version for your hardware or software product. Use Adobe Acrobat Reader to open the manuals and release notes, search for the sections you need, and print them on most standard printers. Go to Adobe Systems at www.adobe.com to download a free copy of Acrobat Reader.

You can purchase selected documentation sets, CDs, and technical publications through the Internet at the www1.fatbrain.com/documentation/nortel/ URL.

How to Get Help

If you purchased a service contract for your Nortel Networks product from a distributor or authorized reseller, contact the technical support staff for that distributor or reseller for assistance.

If you purchased a Nortel Networks service program, contact one of the following Nortel Networks Technical Solutions Centers:

Technical Solutions Center	Telephone
EMEA	(33) (4) 92-966-968
North America	(800) 2LANWAN or (800) 252-6926
Asia Pacific	(61) (2) 9927-8800
China	(800) 810-5000

An Express Routing Code (ERC) is available for many Nortel Networks products and services. When you use an ERC, your call is routed to a technical support person who specializes in supporting that product or service. To locate an ERC for your product or service, go to the www12.nortelnetworks.com/ URL and click ERC at the bottom of the page.

Chapter 1

Using the 56/64K DSU/CSU Adapter Module in an Access Node (AN) or Access Node Hub (ANH) Router

This chapter supplements *Installing an Adapter Module in an AN or ANH Router*. Follow the hardware installation steps in that manual, then refer to this document for information specific to the 56/64K DSU/CSU adapter module.

Verifying AN/ANH Router Requirements

[Table 1-1](#) shows the version and location of required programmable read-only memory (PROM) code for the 56/64K DSU/CSU adapter module.

Table 1-1. PROM Diagnostic and Boot Code for AN/ANH Routers

Code Type	Minimum Version	Directory	File Name
Boot	9.00	<i>an_proms</i>	<i>anboot.exe</i>
Diagnostic	7.26	<i>an_proms</i>	<i>anddiag.exe</i>

For information on upgrading PROMs, see the BayRS™ *Upgrading Routers* guide.

Attaching Cables

Connect the Telco service cable to the RJ-48C connector on the installed 56/64K DSU/CSU adapter module.

You install the adapter module in an open adapter module slot on the router, as follows:

- AN or 12-port ANH -- the back-panel adapter module slot ([Figure 1-1](#)).
See *Installing an Adapter Module in an AN or ANH Router*.
- 8-port ANH -- the back-panel COM3 slot ([Figure 1-2](#)).
See *Installing an Adapter Module in an AN or ANH Router*.

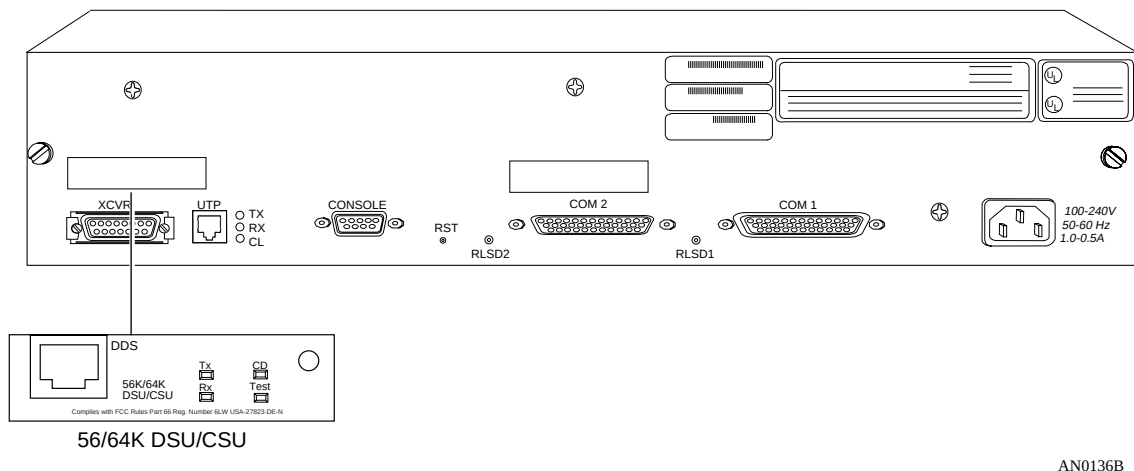


Figure 1-1. 56/64K DSU/CSU Adapter Module Connector on an AN or 12-Port ANH

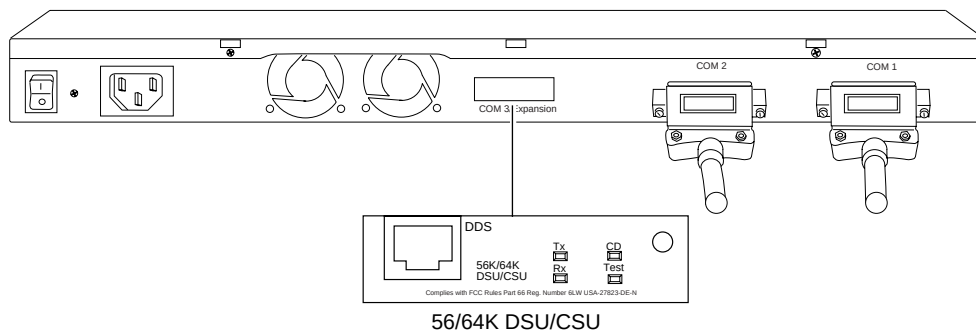


Figure 1-2. 56/64K DSU/CSU Adapter Module Connector on an 8-Port ANH

Completing Software Configuration

Once you have successfully installed the adapter module, complete the following software configuration tasks using instructions found in your BayRS documentation:

Configuration Task	Location of Instructions
Connect the AN/ANH to the network. Note that you cannot perform a Netboot or Directed Netboot operation using the 56/64K DSU/CSU adapter module interface. The boot/startup methods you can use from the 56/64K DSU/CSU interface are Local Boot and EZ-Install.	One of the following: • <i>Installing and Operating AN and ANH Routers</i> • <i>Configuring Remote Access for AN and Passport ARN Routers</i>
Modify the configuration file to add the 56/64K DSU/CSU module and enable default software services.	Any of the following: • <i>Configuring and Managing Routers with Site Manager</i> • <i>Using the Bay Command Console (BCC™)</i>
Configure 56/64K DSU/CSU line services.	<i>Configuring WAN Line Services</i>

For the latest information, be sure to review the release notes and documentation change notice for your version of BayRS software.

Interpreting LEDs

The 56/64K DSU/CSU LEDs ([Figure 1-3](#)) will blink on and off during diagnostic testing, but they will not stay on to indicate data transfer until you have configured and enabled software services.

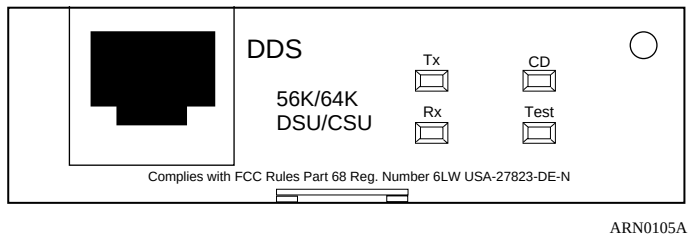


Figure 1-3. 56/64K DSU/CSU Adapter Module LEDs

[Table 1-2](#) describes the function of each 56/64K DSU/CSU LED.

Table 1-2. 56/64K DSU/CSU Adapter Module LEDs

LED	Meaning
Tx (Transmit Data)	Lights when the interface transmits data over the network.
Rx (Receive Data)	Lights when the interface receives data from the network.
CD (Carrier Detect)	Lights when the interface detects a connection to another device.
Test	Lights when the interface is in test or loopback mode.

Chapter 2

Using the 56/64K DSU/CSU Adapter Module in a Passport ARN Router

This chapter supplements *Installing and Operating Passport ARN Routers* (Chapter 4, “Installing a WAN Adapter Module”). Follow the hardware installation steps in that manual, then refer to this document for information specific to the 56/64K DSU/CSU adapter module.

Verifying ARN Router Requirements

[Table 2-1](#) shows the version and location of required programmable read-only memory (PROM) code for the 56/64K DSU/CSU adapter module.

Table 2-1. PROM Diagnostic and Boot Code for ARN Routers

Code Type	Minimum Version	Directory	File Name
Boot	1.17	<i>arn_proms</i>	<i>arnboot.exe</i>
Diagnostic	1.30	<i>arn_proms</i>	<i>arndiag.exe</i>

For information on upgrading PROMs, see the BayRS *Upgrading Routers* guide.

Attaching Cables

Connect the Telco service cable to the RJ-48C connector on the installed 56/64K DSU/CSU adapter module.

You install the adapter module in one of the two front-panel WAN adapter module slots ([Figure 2-1](#)). See *Installing and Operating Passport ARN Routers* for complete installation instructions.

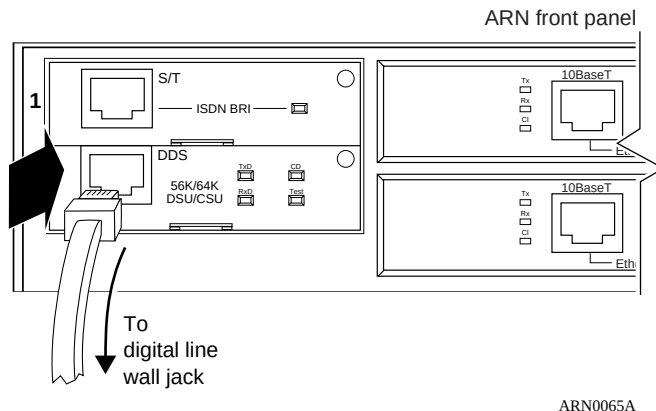


Figure 2-1. ARN 56/64K DSU/CSU Adapter Module (Slot 2)

Completing Software Configuration

Once you have successfully installed the adapter module, complete the following software configuration tasks using instructions found in your BayRS documentation:

Configuration Task	Location of Instructions
Connect the ARN to the network.	One of the following: • <i>Installing and Operating Passport ARN Routers</i> • <i>Configuring Remote Access for AN and Passport ARN Routers</i>
Modify the ARN configuration file to add the 56/64K DSU/CSU module and enable default software services.	Any of the following: • <i>Configuring and Managing Routers with Site Manager</i> • <i>Using the Bay Command Console (BCC)</i>
Configure 56/64K DSU/CSU line services.	<i>Configuring WAN Line Services</i>

For the latest information, be sure to review the release notes and any documentation change notice for your version of BayRS software.

Interpreting LEDs

The 56/64K DSU/CSU LEDs ([Figure 2-2](#)) will blink on and off during diagnostic testing, but they will not stay on to indicate data transfer until you have configured and enabled software services.

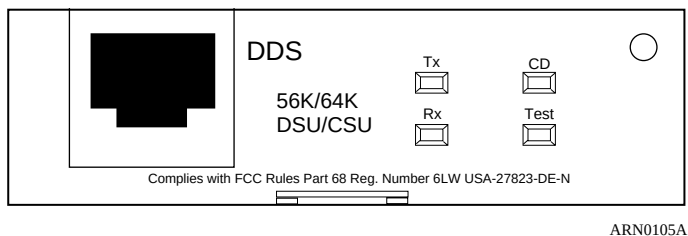


Figure 2-2. ARN 56/64K DSU/CSU Adapter Module LEDs

[Table 2-2](#) describes the function of each 56/64K DSU/CSU LED.

Table 2-2. 56/64K DSU/CSU Adapter Module LEDs

LED	Meaning
Tx (Transmit Data)	Lights when the interface transmits data over the network.
Rx (Receive Data)	Lights when the interface receives data from the network.
CD (Carrier Detect)	Lights when the interface detects a connection to another device.
Test	Lights when the interface is in test or loopback mode.

Chapter 3

Using the 56/64K DSU/CSU Adapter Module in a Passport 5430 Multiservice Access Switch

This chapter supplements *Installing and Operating the Passport 5430 Multiservice Access Switch*. Follow the hardware installation steps in *Installing and Operating the Passport 5430 Multiservice Access Switch*, then refer to this document for information specific to the 56/64K DSU/CSU adapter module.

WAN Adapter Module Placement Considerations

When installing WAN adapter modules in the Passport 5430 module slots, note the following:

- Each WAN adapter module you install is automatically assigned a circuit, even if the WAN adapter module has not been configured. This prevents disruption of active circuits if you reconfigure the module at a later time.
- You can configure a total of 4 circuits.
- An ISDN BRI adapter module has the resources to bring up a second B channel (thus using 2 circuits).

Other supported WAN adapter modules (listed below) use only one circuit.

- 56/64K DSU/CSU
- FE1/E1 DSU/CSU
- FT1/T1 DSU/CSU
- Serial
- V.34 modem

If you use two ISDN BRI adapters and no other WAN adapter module, both ISDN BRI modules have two circuits available for use and therefore each can bring up two B channels plus one D channel.

If you use two ISDN BRI adapters and another WAN adapter module, the number of circuits available to WAN adapters stays the same while the total number needed by the WAN adapters increases by one. This affects the number of B channels the ISDN BRI adapters can bring up, as shown in [Table 3-1](#).

Table 3-1. WAN Adapter Combinations

	Module 3	Module 4	Module 5
Combination 1	56/64K, FE1/E1, FT1/T1 Serial, or V.34 modem	ISDN BRI -- Two B channels plus one D channel	ISDN BRI -- One B channel plus one D channel
Combination 2	ISDN BRI -- Two B channels plus one D channel	56/64K, FE1/E1, FT1/T1 Serial, or V.34 modem	ISDN BRI -- One B channel plus one D channel
Combination 3	ISDN BRI -- Two B channels plus one D channel	ISDN BRI -- One B channel plus one D channel	56/64K, FE1/E1, FT1/T1 Serial, or V.34 modem

Verifying Passport 5430 Requirements

[Table 3-2](#) shows the version and location of required programmable read-only memory (PROM) code for the 56/64K DSU/CSU adapter module.

Table 3-2. PROM Diagnostic and Boot Code Requirements

Code Type	Minimum Version	Directory	File Name
Boot	1.00	<i>fbr_proms</i>	<i>pp5400.exe</i>
Diagnostic	1.00	<i>fbr_proms</i>	<i>fbrdiag.exe</i>

For information on upgrading PROM, see the *BayRS Upgrading Routers* guide.

Attaching Cables

Connect the Telco service cable to the RJ-48C connector on the installed 56/64K DSU/CSU adapter module.

You install the adapter module in one of the three front-panel module slots ([Figure 3-1](#)).

See *Installing and Operating the Passport 5430 Multiservice Access Switch* for complete installation instructions.

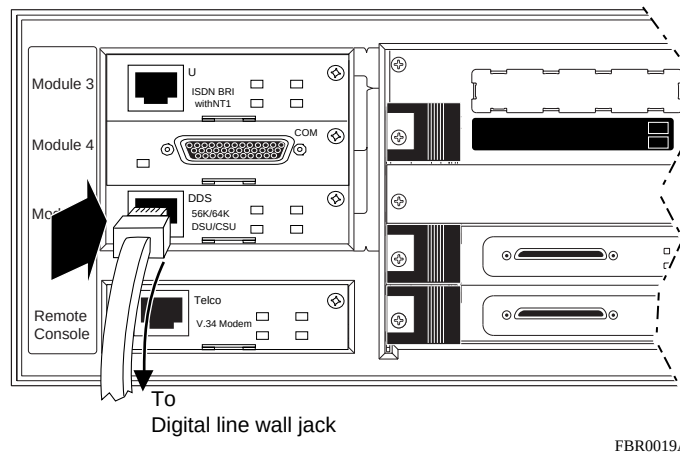


Figure 3-1. 56/64K DSU/CSU Adapter Module Connector on a Passport 5430



Note: The slot labeled Remote Console is reserved for the V.34 modem adapter module. Do not install the 56/64K DSU/CSU adapter module in the Remote Console slot.

Completing Software Configuration

Once you have successfully installed the adapter module, complete the following software configuration tasks using instructions found in your BayRS documentation:

Configuration Task	Location of Instructions
Modify the Passport 5430 configuration file to add the 56/64K DSU/CSU module and enable default software services.	One of the following: • <i>Configuring and Managing Routers with Site Manager</i> • <i>Using the Bay Command Console (BCC)</i>
Configure 56/64K DSU/CSU line services. You can use the DSU/CSU interface for direct connection to Telco leased-line circuits. The integrated DSU/CSU supports either 64 Kb/s Clear Channel or 56 Kb/s DDS services.	<i>Configuring WAN Line Services</i>

For the latest information, be sure to review the release notes and any documentation change notice for your version of BayRS software.

Interpreting LEDs

The 56/64K DSU/CSU LEDs ([Figure 3-2](#)) will blink on and off during diagnostic testing, but they will not stay on to indicate data transfer until you have configured and enabled software services.

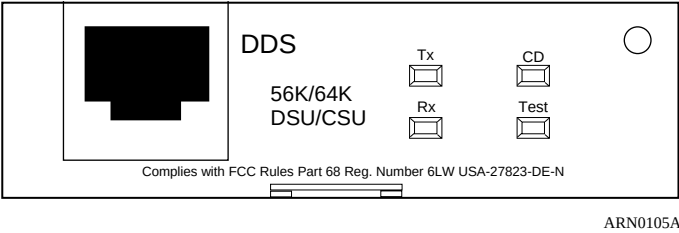


Figure 3-2. 56/64K DSU/CSU Adapter Module LEDs

[Table 3-3](#) describes the function of each 56/64K DSU/CSU LED.

Table 3-3. 56/64K DSU/CSU Adapter Module LEDs

LED	Meaning
Tx (Transmit Data)	Lights when the interface transmits data over the network.
Rx (Receive Data)	Lights when the interface receives data from the network.
CD (Carrier Detect)	Lights when the interface detects a connection to another device.
Test	Lights when the interface is in test or loopback mode.

Chapter 4

Using the 56/64K DSU/CSU Adapter Module in a Passport 2430 Multiservice Access Switch

This chapter supplements *Installing and Operating the Passport 2430 Multiservice Access Switch*. Follow the hardware installation steps in that manual, then refer to this document for information specific to the 56/64K DSU/CSU adapter module.

Attaching Cables

Connect the Telco service cable to the RJ-48C connector on the installed 56/64K DSU/CSU adapter module.

You install the adapter module in one of the two rear-panel WAN adapter module slots ([Figure 4-1](#)). See *Installing and Operating the Passport 2430 Multiservice Access Switch*.

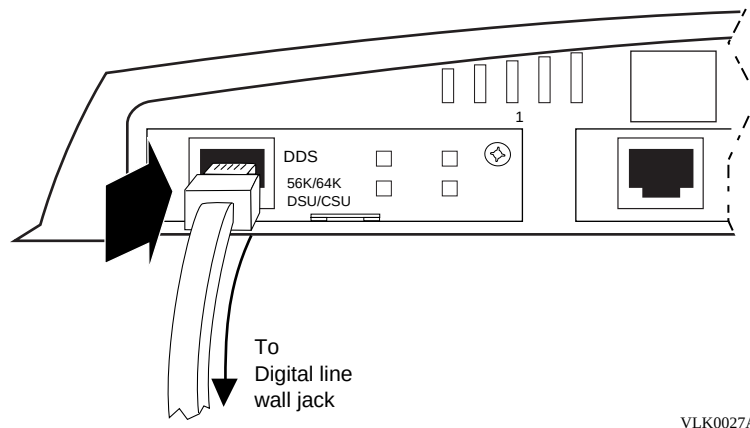


Figure 4-1. 56/64K DSU/CSU Adapter Module Connector on a Passport 2430

Completing Software Configuration

Once you have successfully installed the adapter module, complete the following software configuration tasks using instructions found in your BayRS documentation:

Configuration Task	Location of Instructions
Connect the Passport 2430 to the network.	One of the following: • <i>Installing and Operating the Passport 2430 Multiservice Access Switch</i> • <i>Configuring Remote Access for AN and Passport ARN Routers</i>
Modify the configuration file to add the 56/64K DSU/CSU module and enable default software services.	Any of the following: • <i>Configuring and Managing Routers with Site Manager</i> • <i>Using the Bay Command Console (BCC)</i>
Configure 56/64K DSU/CSU line services.	<i>Configuring WAN Line Services</i>

For the latest information, be sure to review the release notes and any documentation change notice for your version of BayRS software.

Interpreting LEDs

The 56/64K DSU/CSU LEDs ([Figure 4-2](#)) will blink on and off during diagnostic testing, but they will not stay on to indicate data transfer until you have configured and enabled software services.

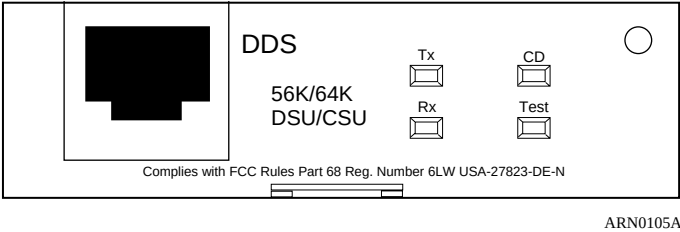


Figure 4-2. 56/64K DSU/CSU Adapter Module LEDs

[Table 4-1](#) describes the function of each 56/64K DSU/CSU LED.

Table 4-1. 56/64K DSU/CSU Adapter Module LEDs

LED	Meaning
Tx (Transmit Data)	Lights when the interface transmits data over the network.
Rx (Receive Data)	Lights when the interface receives data from the network.
CD (Carrier Detect)	Lights when the interface detects a connection to another device.
Test	Lights when the interface is in test or loopback mode.

